Tucson Electric Power

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August 24, 2020

Arizona Corporation Commission
1200 West Washington Street
Phoenix, AZ 85007

RE: In the matter of the Application of Tucson Electric Power Company for Approval of its Distributed Generation Interconnection Manual, Docket No. E-01933A-20-0116

Response to AriSEIA's August 19, 2020 Letter

Dear Chairman Burns and Commissioners:

I am writing on behalf of Tucson Electric Power Company ("TEP") in response to a letter recently filed by the Arizona Solar Energy Industries Association ("AriSEIA") regarding the Commission's Distributed Generation Interconnection Rules ("DGIRs"). Contrary to certain inaccurate representations and characterizations made by AriSEIA, TEP is following the DGIRs and is working diligently and cooperatively to accommodate additional solar installations.

In fact, since implementing the Commission's new DGIRs, TEP has approved over 94% of customer applications for new solar installations under 20 kW (and about 19% of the projects that initially failed were subsequently approved due to modifications agreed to by the customer). We are also planning additional distribution system investments to safely, reliably and cost-effectively accommodate more distributed energy resources ("DERs") and are beginning preparations to conduct a hosting capacity study.

I. Application of Screening Criteria

AriSEIA asserts that TEP is not following Screen A under A.A.C. R14-2-261 5 of the DGIRs. This provision reads as follows:

> *For Interconnection of a proposed Generating Facility to a distribution circuit, the aggregated generation on the circuit, including the proposed Generating Facility, shall not exceed 15% of the total circuit annual peak load as most recently measured at the substation or on the line section (if available), or the circuit hosting capacity limit; whichever is greater.*

AriSEIA is correct that one of TEP's criteria under Screen A is to determine whether the proposed system exceeds 100% of the minimum daytime load of the circuit. However, contrary to AriSEIA's assertions, applying this analysis *does not* violate the DGIRs because the DGIRs already provide for this analysis in the Supplemental Review. Moreover, the DGIRs purposefully do not provide a definition of "hosting capacity." This flexibility that the Commission saw fit to

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ACC - Docket Control - Docketed 8/24/2020 4:00 PM

provide in the DGIRs affords utilities with the ability to consider the unique design and capabilities of their respective distribution systems and to identify potential safety and reliability concerns. AriSEIA appears to believe that TEP must perform hosting capacity studies for each of TEP's nearly 400 feeder circuits. However, such studies are not expressly required by the DGIRs and TEP historically has not had any need to conduct such studies. Indeed, hosting capacity studies are complex, expensive, and lengthy. There also is no industry standard or prescribed method for conducting a hosting capacity study for distribution feeder circuits due to many factors including the uniqueness of utility system designs.[1]

In order to ensure that DG systems do not jeopardize safety or reliability, TEP is using the flexibility in the rules to measure hosting capacity with an industry-standard screen that is already required in the DGIRs, as follows:

> ***R14-2-2620. Supplemental Review***
> *E. A Utility shall apply the following screens in its Supplemental Review:*
> *1. A minimum load screen:*
>
> *a. If 12 months of line section minimum load data (including onsite load but not station service load served by the Generating Facility) are available, can be calculated, can be estimated from existing data, or can be determined from a power flow model, the aggregate Generating Facility Maximum Capacity on the line section* ***shall be less than 100% of the minimum load*** *for all line sections bounded by automatic sectionalizing devices upstream of the Generating Facility*
>
> . . .
>
> *c. In making its determination of compliance with subsections (E)(1)(a) and (b), the Utility shall: i. Consider the type of generation used by the Generating Facility when calculating, estimating, or determining the circuit or line section minimum load, using* ***daytime minimum load*** *for solar photovoltaic generation systems with no battery storage (i.e., 10 a.m. to 4 p.m. for fixed panel systems and 8 a.m. to 6 p.m. for solar photovoltaic generation systems utilizing tracking systems), and using absolute minimum load for all other generation*
>
> *(Emphasis added)*

The Electric Power Research Institute ("EPRI") also has simply defined hosting capacity as:

[1] https://www.nrel.gov/dgic/assets/pdfs/2014-04-30_minimum-day-time-load-calculation-and-screening.pdf

> *The hosting capacity of a distribution feeder is the amount of distributed energy resources (DER) that can be accommodated without adversely impacting power quality or reliability under existing feeder design and control configurations.*[2]

Further, a joint project of the U.S. Department of Energy, the National Renewable Energy Laboratory ("NREL") and others concluded:

> *The fact that PV generation has a strictly daytime pattern is significant considering that voltage impacts tend to be greater during periods of highest instantaneous penetration. By the time PV systems are producing a substantial amount of power, loads are well above their nightly lows on most feeders. Therefore, it makes sense to consider* ***minimum daytime load as a technical screening criterion****.*[3] *(Emphasis added)*

Finally, the Federal Energy Regulatory Commission ("FERC") utilizes a similar method in conducting a supplemental review of small generator (< 20 MW) interconnections to public utility transmission systems.[4] TEP thus uses an industry-standard and FERC-accepted method of examining 100% of the minimum daytime load of the circuit in determining its hosting capacity.

II. Consideration of Reliability and Safety

AriSEIA appears to ignore that the purpose of the interconnection screens is to ensure the safety and reliability of the distribution system, and disregards the potentially dangerous consequences of waiving screening criteria (which is something AriSEIA suggests TEP should do). The distributed generation capacity of a circuit is limited by the amount of "back-feeding" and "islanding" it can sustain before system integrity is damaged.[5] These issues can create a significant safety risk for our employees and cause damage to a customer's electrical equipment that is sensitive to voltage fluctuations.

Therefore, it is imperative that DG installations continue to be reviewed under Screen A to ensure they are interconnected safely and reliably. As noted in the TEP memo attached to

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[2] https://www.epri.com/research/products/3002011081

[3] https://core.ac.uk/download/pdf/193310275.pdf, page 6 (emphasis added).

[4] https://ferc.gov/sites/default/files/2020-06/RM13-2-000_0.pdf; Page 82, Section 143 and Page 16 (pdf page 183), Section 2.4.4.1.1

[5] DGIRs R14-2-2601 Definitions:
"Backfeed" means to energize a section of a Utility electric system with a Generating Facility.
"Islanding" means a condition in which a portion of the Distribution System is energized solely by one or more local electric power systems throughout the associated Point of Interconnection while that portion of the Distribution System is electrically separated from the rest of the Distribution System. Islanding can be either intentional (planned) or unintentional (unplanned).

AriSEIA's letter, "…feeder minimum daytime load (and not feeder peak load) is the true indicator of safety and reliability risk, whereby back-feeding the circuit or islanding potential can be identified."

AriSEIA states that no other Arizona utility is applying hosting capacity criteria in this manner, implying that a "one size fits all" approach is warranted. TEP notes that utility circuit designs differ by utility and within utility system configurations. In addition, cooperatives and other smaller utilities apparently do not yet have DG saturated feeders and thus may not be experiencing back-feeding. Because TEP is experiencing these conditions in certain areas of its distribution system, we are prioritizing safety and reliability by choosing to use criteria that prevents back-feeding and islanding.

III. Failed Screening Installations are Provided With Options

AriSEIA neglects to note that in the event a customer does not pass Screen A, the customer is not prevented from installing a system. TEP does not "punish" the customer as AriSEIA contends; rather the customer is encouraged to complete installation by preventing exporting and back-feeding with their system configuration, thus preventing a risk to safety and reliability. As noted in the TEP memo supplied by AriSEIA, "Thus far, *a majority of applications that did not meet the 15% of feeder peak load threshold did subsequently pass the 100% of feeder minimum daytime load threshold and were approved.*"

Since the implementation of the Commission's new DGIRs, TEP has approved 94.1% of customer applications for new solar installations. Only 5.9% of applications have failed to pass the 15% feeder peak and 100% minimum daytime load screen. For these customers we recommended modifications such as battery storage or advanced inverters with a self-consumption only setting to convert their application into a non-exporting system, thereby making them eligible for installation. As a result, about 19% of those systems that initially failed the daytime load screen subsequently resubmitted as non-exporting systems and were approved for installation.

IV. Project Costs Can Be Easily Minimized

In regard to the project cost factors to which AriSEIA refers, we note that the DGIRs provide for a *free* pre-application report whereby TEP provides an initial evaluation, preventing such costs to be incurred. Confusingly, although AriSEIA comments about these avoidable costs, it also criticizes TEP's efforts to be as transparent as possible with its practices by making feeder maps publicly available on its website.[6] If installers made use of these maps, they could also avoid unnecessary costs and better inform customers during the sales process. TEP has made every effort to educate and inform customers and installers about TEP's process, but has no control over installers who choose to incur costs without acquiring a no-cost preliminary evaluation and utilizing free mapping resources which would otherwise prevent these costs.

[6] https://www.tep.com/get-started-with-solar/#maps

V. TEP is Accommodating Additional Installations

TEP's distribution system was not originally configured to accommodate excessive solar installations, particularly during shoulder months when substantial amounts of electricity are being exported into a distribution feeder. Over the past several years, TEP has invested significantly in distribution system upgrades that have improved our ability to accommodate energy exports from DG solar systems. However, the processes we have developed to comply with the DGIRs have made clear that more work is needed to accommodate additional DG energy exports in some areas where such systems have proliferated.

Currently, TEP is analyzing 16 feeder circuits that cannot accommodate additional DG energy exports without violating the DGIRs or compromising safety and reliability. The results of this study will allow TEP to develop a plan for distribution system upgrades that would accommodate additional DG exports on some or all of these circuits. TEP will also perform a hosting capacity study for other circuits and within 90 days of completion of the study will provide a report to Commission Staff.

These steps are consistent with our commitment to build a cleaner, greener grid in partnership with our customers. To date, we have connected more than 27,000 DG solar systems to our local energy grid, totaling over 356 MW – including nearly 2,000 installations this year alone. We have also found other ways to help our customers achieve their green energy objectives. Last year, we committed to provide the University of Arizona with 100% clean energy to its Tucson campus by 2021 from future wind and solar power systems.

Looking to the future, TEP's 2020 Integrated Resource Plan proposes a plan to provide 70% of our power from renewable resources by 2035 with a portfolio that reduces carbon dioxide emissions by 80%. In addition to our own resources, that portfolio will include a growing number of DG systems installed by customers. Consistent with the DGIRs approved by this Commission, we stand ready to help our customers connect those systems safely and reliably.

Sincerely,

/s/Erik Bakken

Erik Bakken
Vice President, System Operations and Energy Resources
Tucson Electric Power Company

cc: Docket Control